

CLAIMS

What is claimed is:

1. An electronic device comprising:

a device printed wiring board;

an electrical connector connected to the device printed wiring board;

a camera coupled to the device printed wiring board by the electrical connector at a stepless movement height connection,

wherein the stepless movement height connection allows the camera to slide relative to the electrical connector along a first axis to allow positioning of the camera relative to the electrical connector at one of a plurality of different heights along the first axis.

2. As electronic device as in claim 1 wherein the electronic device comprises a hand-held portable electronic device.

3. An electronic device as in claim 1 wherein the electronic device comprises a mobile telephone.

4. An electronic device as in claim 1 wherein the electrical connector comprises a camera receiving slot with electrical contacts extending into the camera receiving slot, and wherein the camera is located in the camera receiving slot.

5. An electronic device as in claim 1 wherein the device printed wiring board comprises a slot, and wherein the camera extends through the slot.

6. An electronic device as in claim 5 wherein the camera comprises spring contacts and the electrical connector comprises substantially stationary conductors, and wherein the spring contacts are adapted to slide along the substantially stationary conductors when the camera is inserted into the electrical connector and into the slot of the device printed wiring board.

7. An electronic device as in claim 1 wherein the camera comprises a housing and electrical conductors on the housing, wherein the electrical conductors extend along a first lateral exterior side of the housing.

8. An electronic device as in claim 7 wherein the electrical conductors extend along an opposite second lateral exterior side of the housing, and wherein the electrical connector comprises contacts located in a camera receiving slot of the electrical connector and electrically contacting the electrical conductors on the first and second lateral sides of the housing of the camera.

9. An electronic device as in claim 7 wherein the electrical conductors extend along an adjacent side of the housing, wherein the camera comprises a camera printed wiring board attached to the electrical conductors on the adjacent side of the housing.

10. An electronic device as in claim 1 wherein the electrical connector comprises a housing having a general ring shape with a center camera receiving slot, and

electrical spring contacts extending into the camera receiving slot from opposite sides of the general ring shape.

11. An electronic device as in claim 1 wherein the camera extends through the electrical connector in a general substantially stationery telescoping arrangement.

12. A portable electronic device camera comprising:

a housing;

electrical conductors along a first lateral side of the housing; and

a camera printed wiring board stationarily connected to the housing and coupled to the electrical conductors,

wherein the electrical conductors are adapted to be removably connected to contacts of an electrical connector located along the first lateral side of the housing.

13. A portable electronic device camera as in claim 12 wherein the electrical conductors extend along a second opposite lateral side of the housing.

14. A portable electronic device camera as in claim 13 wherein the electrical conductors comprises metallized conductor paths along exterior sides of the housing.

15. A portable electronic device camera as in claim 12 wherein the electrical conductors extend along an adjacent side of the first lateral side, and wherein the camera printed wiring board is electrically connected to the electrical conductors on the adjacent side.

16. A portable electronic device camera as in claim 12 wherein the electrical conductors along the first lateral side are adapted to slide along the contacts of the electrical connector in a first axis of insertion of the portable electronic device camera into the electrical connector to provide an adjustable height connection of the portable electronic device camera to the electrical connector.

17. A portable electronic device camera as in claim 12 wherein the camera printed wiring board is located at a rear end of the housing, and wherein an image inlet aperture is located at a front end of the housing.

18. A mobile telephone comprising:

a mobile telephone printed wiring board; and

a portable electronic device camera **as in claim 12** coupled to the mobile telephone printed wiring board by an electrical connector.

19. A printed wiring board and electrical connector subassembly comprising:

a mobile telephone printed wiring board having a transceiver attached to the mobile telephone printed wiring board; and

a camera electrical connector attached to the mobile telephone printed wiring board,

wherein the camera electrical connector comprises a camera receiving area adapted to receive a camera therein and make electrical contact with conductors of the camera inside the camera receiving area, and

wherein the camera receiving area comprises a through hole extending entirely through a housing of the camera electrical connector.

20. A printed wiring board and electrical connector subassembly as in claim 19 wherein the camera electrical connector comprises spring contacts extending into the camera receiving area from a first lateral side of the camera receiving area.

21. A printed wiring board and electrical connector subassembly as in claim 20 wherein the spring contacts extend into the camera receiving area from a second opposite lateral side of the camera receiving area.

22. A printed wiring board and electrical connector subassembly as in claim 20 wherein the camera electrical connector comprises a housing with a general ring shape and wherein the camera receiving area is located inside the general ring shape.

23. A mobile telephone comprising:

a printed wiring board and electrical connector subassembly as in claim 19; and

a portable electronic device camera coupled to the mobile telephone printed wiring board by the camera electrical connector.

24. A portable electronic device comprising:

a device printed wiring board;

an electrical connector connected to the device printed wiring board, wherein the electrical connector has a camera receiving slot; and

a camera coupled to the printed wiring board by the electrical connector, wherein a housing of the camera is located partially inside the camera receiving area to provide a substantially stationery telescoping connection with a partially coplanar height.

25. A portable electronic device as in claim 24 wherein the electrical connector comprises a housing with a general ring shape and wherein the camera receiving slot is located inside the general ring shape.

26. A portable electronic device as in claim 24 wherein the electrical connector comprises electrical spring contacts extending into a lateral side of the camera receiving slot.

27. A portable electronic device as in claim 26 wherein the electrical spring contacts extend into the camera receiving slot from two opposite lateral sides.

28. A portable electronic device as in claim 24 wherein the camera comprises electrical conductors on at least one lateral side of the housing of the camera which are located inside the camera receiving slot.

29. A portable electronic device as in claim 28 wherein the electrical conductors comprises metallized conductors formed on exterior sides of the housing of the camera.

30. A portable electronic device as in claim 24 wherein the portable electronic device comprises means for locating the camera at a plurality of different heights relative to the device printed wiring board.

31. A portable electronic device as in claim 30 wherein the means for locating the camera comprises the camera extending through a slot in the device printed wiring board.

32. A portable electronic device as in claim 24 wherein the portable electronic device comprises a mobile telephone with a transceiver connected to the device printed wiring board.

33. A method of assembling a portable electronic device comprising:

providing an electrical connector on a printed wiring board;

inserting a camera into a slot through the electrical connector; and

making electrical connection between the electrical connector and the camera at a first lateral side of the camera inside the slot of the electrical connector.

34. A method as in claim 33 wherein the step of inserting the camera through the slot of the electrical connector also comprises inserting the camera through a slot of the printed wiring board.

35. A method as in claim 33 wherein the step of making electrical connection between the electrical connector and the camera comprises electrical conductors on the first lateral side of the camera contacting spring contacts of the electrical connector inside the slot of the electrical connector.

36. A method as in claim 33 wherein the step of making electrical connection between the electrical connector and the camera comprises sliding electrical conductors of the camera along electrical contacts of the electrical connector along an insertion path of the camera into the slot of the electrical connector.

37. An electronic device comprising:

a device printed wiring board having a slot therethrough; and

a camera extending through the slot in the device printed wiring board and coupled to the device printed wiring board by a stepless movement variable height connection,

wherein the stepless movement variable height connection allows the camera to slide relative to the device printed wiring board along a first axis to allow positioning of the camera relative to the device printed wiring board at one of a plurality of different heights along the first axis.

38. An electronic device as in claim 37 wherein the device printed wiring board comprises contact pads at the slot and the camera comprises spring contacts in the slot and slidable along the contact pads.